

## Application: Digital Visual Interface (DVI) & Digital Displays Pericom Device: PI3DBV40, PI3DBV20, PI3DBV10 Switches

### Overview

The Digital Visual Interface (DVI) has become the new industry standard used to drive Digital Flat Panel Displays (FPD), Plasma Display Panels (PDP), and HDTV. This new digital video interface is rapidly replacing today's analog VGA connectors used to interface Video Graphics Cards to the traditional desktop PC's CRT monitor. Other digital interface standards such as Plug and Display (P&D) have gained acceptance in the PC projection industry, while the Digital Flat Panel (DFP) standard never gained industry acceptance. The Digital Set Top Box (STB) manufacturers are currently considering the adoption of the DVI interface.

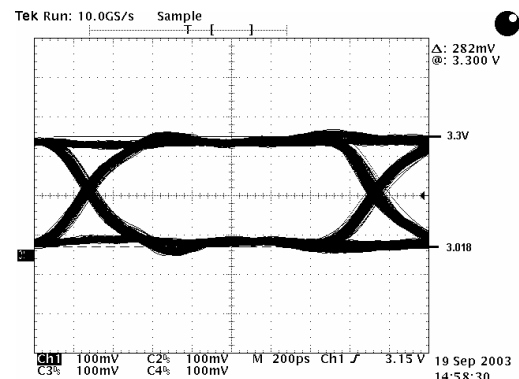
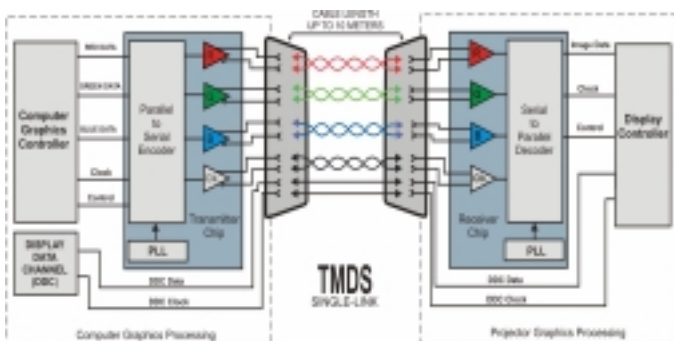
DVI is based on a signaling standard called Transition Minimized Differential Signaling (TMDS) which was invented by Silicon Image to transmit high resolution digital video over twisted pairs of wires that simplify the transport over 10 meters in length. The link architecture encodes traditional Red, Green, Blue (RGB) data streams from a PC's Graphics Controller by serializing them into three sets of TMDS channels for transmission to a Digital Display. An additional TMDS channel is used to transmit the clocking signal to help decode the three TMDS RGB data streams at the DVI receiver located in the display panel.

A single DVI link can support digital displays with resolutions up to 1600 x 1200 (UXGA) at 60 Hz (165 MHz of bandwidth or 165 mega pixels per seconds), while a two channel DVI link can support up to 2048 x 1536 (QXGA) at 60 Hz (330 MHz of bandwidth or 330 mega pixels per second). A universal DVI -D connector was developed to support both single and dual channel DVI. The single channel DVI interface is shown below. A dual DVI interface would add three more TMDS channels for a total of six and use a common TMDS clock signal over a seventh channel. The dual channel DVI link separates the positive and negative RGB signals and sends them over the six TMDS channels.



### Pericom Overview

The PI3DBVxx IC's are a family of Differential Broadband Video (DBV) switches offered by Pericom. These ICs are ideally suited to support TMDS video signaling required in DVI and P&D interfaces. This new breed of video switches will support TMDS signals up to 700MHz or 1.4Gbps data rates as well as LVDS signals up to 600 MHz or 1.2 Gbps data rates. Pericom's PI3DBV40 (4-Channel x 2:1 mux) provides a way to switch between two RGB encoded TMDS data streams to a common DVI connector. Two additional ICs called the PI3DBV20 (2-Channel x 2:1 mux) and the PI3DBV10 (1-channel x 2:1 mux) are also supported. These additional products can be used to support a complete dual channel DVI link. Performance of a PI3DBV20 IC is shown with a TMDS signal measured at an operating frequency of 700MHz or supporting a 1.4 Gbps channel data rate. The eye pattern is very clean and exhibits no amplitude or signal distortion.



## Key Features & Specifications

- ❑ Differential 1, 2, or 4-Channel x 2:1 Mux/Demux Sw
- ❑ Low On-Resistance: 4-Ohms
- ❑ Low Channel-to-Channel Skew: 100 picoseconds
- ❑ Low Crosstalk: -27 decibels @ 250 Megahertz
- ❑ High Off Isolation: -32 decibels @ 250 Megahertz
- ❑ Near-Zero Propagation Delay: 250 picoseconds
- ❑ Fast Switching Speed: 9 nanoseconds
- ❑ Low On-Capacitance: 6 picoFarads
- ❑ VCC Operating Range: +3.0 Volts to +3.6 Volts
- ❑ ESD: >2000 Volts ... Human Body Model
- ❑ Bandwidth/Data Frequency: >700 Megahertz
- ❑ Packages Available:
  - 16 and 48-pin TSSOP
  - 12 – pin TDFN

## Key Benefits

- ❑ Provides a way to switch between 2 DVI signal links in a compact solution.
- ❑ Supports all high resolution digital video formats for Ultra XGA (1600 x 1200), High Definition TV (1920 x 1080), Quad KGA (QXGA)
- ❑ Easy layout (Does not require multiple PCB layers for routing the I/O lines)

## Product Status and Pricing

- ❑ Samples:            Available 11/25/03
- ❑ Production:        Available 11/25/03
- ❑ Pricing:
  - ❑ PI3DBV40: \$3.00 per 1,000 pieces
  - ❑ PI3DBV20: \$1.50 per 1,000 pieces
  - ❑ PI3DBV10: \$0.75 per 1,000 pieces

## Typical Customer

- ❑ Switch multiple DVI links to a common DVI connector Digital Panel Display (Plasma, TFT, HDTV)
- ❑ Video Graphic Cards
- ❑ Projection equipment
- ❑ PCs
- ❑ Set top boxes

## Additional Information

- ❑ On the Public Website (November 2003)
  - ❑ [Application Note](#) (November 2003)
  - ❑ [Datasheet](#) (November 2003)

## Contact Information

Please contact your local Pericom Sales Representative or franchised distributor. [www.pericom.com/contact](http://www.pericom.com/contact)

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